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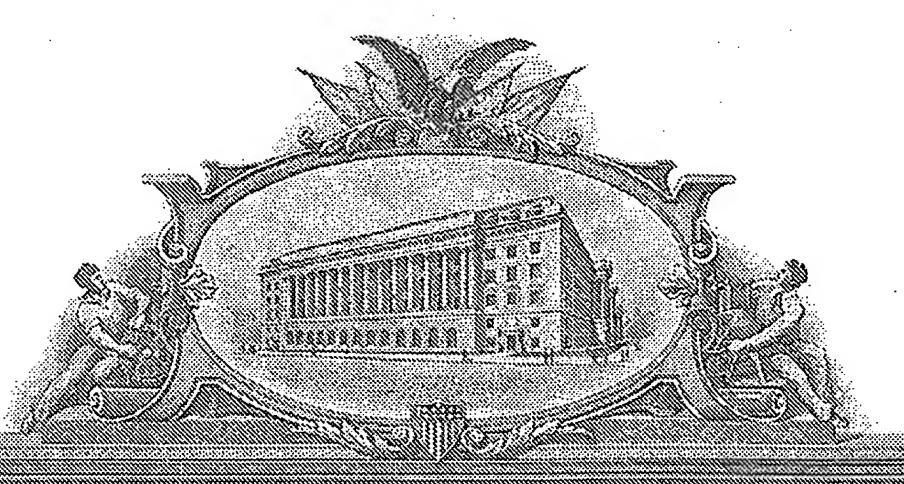
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UNITED STATES DEPARTMENT OF COMMERCE

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March 22, 2006

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FILING DATE: January 14, 2005
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THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS **CONVENTION, IS** *US60/644,241*

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This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (c).

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|---|--|------------------------|---------------------------------------|---------------------------------|--|-------------|----------------|
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| Michael D. | | Hays | | | Omaha, NE | | |
| Additional inventors are being | ng named on th | e sej | parately number | ed sheets att | ached hen | eto | |
| | TITLE C | F THE INV | ENTION (500 cf | aracters ma | x) | | |
| Connection Bracket for Modular, Corner, Insulated Panel Concrete Wall Forms | | | | | | | |
| Direct all correspondence to: | Direct all correspondence to: CORRESPONDENCE ADDRESS | | | | | | |
| □ Customer Number | | | | | | • | |
| OR | | | · · · · · · · · · · · · · · · · · · · | | | | |
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| Specification Number | r of Pages | <u>14</u> | i | CD(s), N | lumber | | • |
| ☑ Drawing(s) Number of Sheets ☑ Application Data Sheet. See 37 CFR 1.76 ☑ Other (specify) Return Receipt Postcard; Certificate of Mailing by Express Mail | | | | | | | |
| Application Size Fee: If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S. C. 41(a)(1)(G) and 37 C.F.R. 1.16(s). | | | | | | | |
| METHOD OF PAYMENT OF FILING | FEES FOR THE | S PROVISIO | NAL APPLICATION | N FOR PATEN | r | • | |
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| SIGNATURE Docket Number: 06538.00005 | | | | | | | |
| TYPED or PRINTED NAME | Jon O. Nelson | | | | • | | |
| TELEPHONE 312.463.50 | 000 | | - | - | • | | · |

PROVISIONAL APPLICATION COVER SHEET Additional Page

PTO/SB/16 (08-03)

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| INVENTOR(S)/APPLICANT(S) | | | | | |
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CERTIFICATE OF MAILING BY EXPRESS MAIL

(Provisional Patent Application)

Express Mail No. <u>EV 457423064</u>

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(person actually depositing)

In the Application of: Bradley J. Crosby et al.

Title: Connection Bracket

Connection Bracket for Modular, Corner, Insulated Panel Concrete Wall

Forms

Attorney Docket No.: 06538.00005

X Provisional Application for Patent Cover Sheet, 2 pages

X Fee Transmittal For FY 2005 (1 page; in duplicate)

X Application Data Sheet, 5 pages

X Provisional Specification (14 pages, 23 claims)

X Seven (7) Sheets Informal Drawings (Figures 1-11)

X Return Receipt Postcard

SPECIFICATION

Attorney Docket No. 06538.00005

[01] TO ALL WHOM IT MAY CONCERN:

Be it known that Bradley J. Crosby, a citizen of the United States and a resident of Omaha, Nebraska; Michael D. Hays, a citizen of the United States and a resident of Omaha, Nebraska; Jeffrey A. Blake, a citizen of the United States and a resident of Omaha, Nebraska; and Patrick D. Gredys, a citizen of the United States and a resident of Omaha, Nebraska, have invented certain new and useful improvements in a

CONNECTION BRACKET FOR MODULAR, CORNER, INSULATED PANEL CONCRETE WALL FORMS

of which the following is a specification.

BACKGROUND OF THE INVENTION

In a principal aspect the present invention relates to a strut, connector, tie, bracket member or bracket which is used in combination with an insulating foam form for concrete and cement wall construction. In particular, the bracket construction is associated with formation of insulating foam corner forms.

The use of modular insulating foam forms for concrete or cement wall construction is disclosed in many prior art patents and is commonly practiced in the construction industry.

Among the prior art patents depicting such forms and their use are the following:

| | | | <u> </u> |
|--------------|-----------------|----------------------|---|
| Patent No. | <u>Patentee</u> | Date of Patent | <u>Title</u> |
| 4,884,382 | Horobin | December 5, 1989 | Modular Building-Block Form |
| 5,060,446 | Beliveau | October 29, 1991 | Insulating Wall Panel |
| 5,390,459 | Mensen | February 21, 1995 | Concrete Form Walls |
| 5,896,714 | Cymbala et al. | April 27, 1999 | Insulating Concrete Form System |
| 6,230,462 | Beliveau | May 15, 2001 | Concrete Wall Form and Connectors Therefor |
| 6,820,384 B1 | Pfeiffer | November 23, 2004 | Prefabricated Foam Block Concrete Forms and Ties Molded Therein |

Such modular foam forms generally comprise first and second, parallel, spaced, modular sized foam plastic or polystyrene wall panels. The wall panels are connected by brackets which are typically made from molded, rigid plastic materials. The brackets are often referred to as struts, ties or connectors. The foamed wall panels are made in modular sizes and assembled in building block fashion to define a form for a building or foundation wall. Reinforcing bars (rebars) are typically placed on the ties or brackets intermediate the foam panels defining the

[05]

concrete form so that when concrete or cement is poured into the space between the panels, the rebars will effectively reinforce the wall. Various designs of the panels and the connectors or brackets which join or tie the panels together are depicted in the prior art. The design of these panels and the design of the brackets or connectors or ties is highly varied.

[06] A particularly challenging design problem associated with foam panel forms is related to the corners of such forms. Appropriately positioning foam material in combination with ties or brackets in a manner which enables and facilitates the construction of the corners of a building wall is particularly vexing. Prior art patents suggest various corner wall form constructions including the following:

| Patent No. | <u>Patentee</u> | Date of Patent | <u>Title</u> |
|------------|-----------------|--------------------|---|
| 4,765,109 | Boeshart | August 23, 1988 | Adjustable Tie |
| 4,916,879 | Boeshart | April 17, 1990 | Corner Tie |
| 5,658,483 | Boeshart | August 19, 1997 | Corner Joint Tie |
| 5,782,050 | Boeshart | July 21, 1998 | Two-Piece Corner Tie |
| 6,224,631 | Kohrs | May 1, 2001 | Intervertebral Implant with Reduced Contact Area and Method |
| 6,293,067 | Meendering | September 25, 2001 | Tie for Forms for Poured Concrete |
| 6,352,235 | Cizek | March 5, 2002 | Combination Bottle Hook and Wrench |
| 6,691,481 | Schmidt | February 17, 2004 | Corner Form for Modular Insulating Concrete Form System |

[07] The present invention is directed to improved designs of molded plastic brackets, ties or connectors which are especially useful in combination with spaced foam panels to define wall form corners.

SUMMARY OF THE INVENTION

[80]

Briefly, the present invention comprises a corner bracket or tie which includes a first generally horizontal assembly member having an intermediate or generally central, corner section with a projecting wing extension extending laterally from each side of the intermediate or central, corner section. An integral bracing element is typically included to fix and maintain a corner angle between the extending wing extensions. The wing extensions thus may define and include an angle, for example, of 90°, 45° or some other included angle that defines the angle of the corner wall form incorporating the bracket. In addition to the horizontal assembly member, there is included at least one vertical plate member which is attached to or attachable to the horizontal assembly member and which is designed to be embedded or included within at least one of the foam panels forming the corner wall form. The vertical plate member or members are thus embedded in the corner foam panel in a manner which positions them for cooperation with fasteners that are used to attach various materials such as siding, wallboard, etc, to the corner foam panels. Such attachment is particularly desirable at corners of such foam forms, and the present invention is especially useful because it provides a design which positions generally vertical plate members adjacent or at the corners of an insulated foam wall form.

[09]

The corner brackets or ties of the invention thus are at least partially encapsulated into foam panels which intersect or are molded to define a corner, modular, foam panel form. An embodiment of the bracket for combination with an outside foam corner panel and a spaced inside foam corner panel, is constructed to be at least partially embedded in both the inside and outside foam panels. An embodiment of the corner bracket defining an obtuse angle is designed to be at least partially embedded in an outside corner foam panel and to project into the space between an outside corner foam panel and a spaced inside corner foam panel.

[10]

The ties or brackets of the invention thus provide the function of positioning vertical plate members at or adjacent the outside corner insulated foam panel and the further optional function of connecting an outside corner insulating foam panel to an inside corner foam panel. Also in the preferred embodiment the corner bracket is comprised of separate elements including (1) a horizontal assembly which defines, or is compatible with, the desired angular relationship of the

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insulating corner foam panels, and (2) generally vertical plate members which may be slidably inserted into the horizontal corner assembly.

BRIEF DESCRIPTION OF THE DRAWING

- In the detailed description which follows, reference will be made to the drawing comprised of the following figures:
- [12] Figure 1 is an isometric view of an insulated wall form comprised of modular elements including straight wall panel forms and corner forms;
- [13] Figure 2 is a top plan view of the wall form of Figure 1;
- [14] Figure 3 is an isometric view of a corner bracket assembly or corner bracket for a corner wall form;
- Figure 4 is another isometric view of the corner bracket of Figure 3 which may be employed in the creation of a modular, insulated corner wall form of the type depicted in Figure 1;
- Figure 5 is a cross sectional view of the corner bracket depicted in Figure 3 taken substantially along the line 5—5;
- [17] Figure 6 is an isometric view of the horizontal assembly member or plate which is included as an element of the bracket of Figure 3;
- [18] Figure 7 is a side view of the corner bracket depicted in Figure 5 viewed in the direction of the arrow in Figure 5;
- [19] Figure 8 is a top plan view of the corner bracket depicted in Figure 5 as incorporated in spaced foam panels to provide a modular corner wall form;
- [20] Figure 9 is an isometric view of an alternative construction of a corner bracket designed for a 45° corner wall form;
- Figure 10 is a top plan view depicting the corner bracket of Figure 9 as incorporated in spaced foam panels to provide a modular, insulated corner wall form; and

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Figure 11 is an isometric view of the construction of Figure 10.

[22]

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 1 and 2, there is depicted an assembled array of modular, foam panel [23] forms which are utilized, in combination, to provide a form for casting or pouring of a concrete building wall, for example. The prior art patents referenced above generally depict the manner of construction and use of such modular foam forms. Briefly, the modular forms 21 are comprised of modular sized first and second panels 20 and 22 which are formed from a plastic foam material such as polystyrene and are maintained in spaced, connected relationship one with respect to the other by means of brackets, connectors, struts, ties or the like 24. The number and spacing of the brackets 24 may be varied. For modular foam forms which are designed for straight line sections of a wall, the connectors or brackets 24 may, for example, comprise six to eight cross linking members extending between generally parallel spaced, insulating panels 20 and 22. Such parallel or straight modular wall sections of the forms, such as sections 21, will thus in combination define a straight wall form. Reinforcing bars 25 may be positioned on the brackets 24 and concrete or cement may be placed in the region between the foam panels 20 and 22 to encapsulate the reinforcing bars 25 as well as the brackets 24. The materials forming the panels 20 and 22 provide an insulating feature as well as a form.

The present invention relates to the construction of corner forms and brackets such as the right angle corner form 32 in Figure 1 for a corner incorporating a corner bracket 30. Multiple corner forms 32 as well as the straight panel forms 21 may thus be assembled in various combinations to create a complex, large form for pouring of a concrete wall. Obtuse corner forms, such as obtuse corner form 28, may be constructed having an angular relationship other than 90°. For example, the form 28 defines an obtuse angle corner form including angular inside 33 and outside 35 insulating foam panels joined by straight ties or connectors 24 and including a molded plastic corner bracket 102 as described hereinafter. Acute angle forms may also be made in the practice of the invention.

[25] Figures 3, 4, 5, 6, 7 and 8 refer particularly to the corner bracket 30 which is constructed and designed for use in the formation of a 90° angle corner form 32. Figures 9, 10 and 11 illustrate an alternative corner bracket construction utilized for providing a 135° angle corner

form. The invention is not limited to any particular angular relationship of the panel walls of a modular corner foam form, however, and thus the brackets described may be designed to be used with a wide variety of angular corner relationships.

[26]

Referring first to Figures 3-8, the right angle corner bracket embodiment of the invention includes a first generally horizontal assembly member 40. The assembly member 40 includes a generally intermediate corner or angle defining section or portion 42, a first lateral wing extension 44 extending from the intermediate section 42 in one direction and a second lateral wing extension 46 extending from the intermediate section 42 in a generally distinct direction. The included angle between the wing extensions 44 and 42 is approximately 90°. The bracket assembly member 40 further includes a rigid cross brace member 48 connected with a second rigid cross brace member 50. The cross brace members 48 and 50 join together at a juncture 52. A bisecting reinforcing brace 54 extends generally from the apex of the intermediate section 42 and generally bisects the angle between the wing extensions 44 and 46. The brace 54 extends, outwardly from the intermediate section a distance which enables insertion of distal end 56 of the brace 54 into an inside foam panel wall such as depicted in Figure 8 as the foam panel wall 60. Thus, referring to Figure 8, an outer right angle foam panel wall 62 encapsulates the wing extensions 44 and 46 whereas the brace 54 will extend through the space between the panels 60 and 62 to be encapsulated and included within the inside molded corner foam panel 60 during the molding operation of the corner foam form 32. Straight ties 24 may also be molded into the corner forms extending between parallel sections of the panels 60, 62.

[27]

The wing extensions 44 and 46 each include first and second vertical slots 64 and 66; 68 and 70 respectively on the inside face of the wing extensions 44 and 46. These slots 64, 66, 68 and 70 receive bayonet shaped generally vertical, plate members which slide into the slots 64, 66, 68 and 70 as depicted, for example, in Figure 7 as well as in Figures 3 and 4. Thus, the 90° corner bracket further includes a series of plate members 72, 74, 76 and 78 which are arrayed in a generally vertical parallel manner with respect to one another and with respect to the horizontal assembly member 40. Each of the plate members 72, 74, 76 and 78 has a T-shaped cross section in the preferred embodiment and is slidably received respectively the slots 64, 66, 68 and 70 as

previously described. The bayonet shaped plate members 72, 74, 76 and 78 include a stop panel 80 which limits the sliding movement into the respective slots and further includes a detent projection such as the detent projection 84 in Figure 7 which limits the movement of a plate member 74 once it is inserted into an appropriate slot 66, by way of example. In this manner, the plate members, such as the plate member 74, are held in a generally fixed or locked position once inserted into their respective slots, such as slot 66.

In the preferred embodiment, the pairs of vertical plate members 72 and 74 are interconnected one with respect to the other through a molded, flexible hinge section 90 and 92. That is, the generally rigid plate members 72, 74, however, are made from a molded plastic material and are designed to be connected one to the other by means of a flexible linkage or hinge 90 and 92. The plate members 72 and 74, will remain rigidly in place mounted on the wing extension 44. A detent or wedge projection 84 may be provided on one or both sides of the plate member, for example, the plate member 72. Plates such as the plate 76 may include projecting stops or studs 81 as depicted, for example, in Figure 3. In other words, various means may be utilized to generally lock the vertical plates 72, 74, 76, 78 in position in the assembled combination with the generally horizontal assembly member 40 of the corner bracket.

Figure 8 illustrates again the manner in which the 90° corner bracket is encapsulated within foam panels 60, 62 defining the inside face and outside face of a modular corner mold form wherein the foam panel walls 60, 62 are defined by integrally molded right angle foam walls. Note that the horizontal assembly members are typically encapsulated within the foam material as are the vertical brackets or vertical plate members 72 and 74. With the construction of the invention, the vertical plate members 72 and 74 may be positioned closely adjacent a corner, such as a corner 75 of a mold form. Positioning the vertical plate members, as described, enables the attachment of wall board by fasteners, for example, tightly to the region adjacent the corner of the mold form.

[30] That is, typically the straight ties 24 for connecting opposed panel walls 60 and 62; includes a vertical plate member 79 which is generally encapsulated within foam material 62. The plate 79 thus serves as a means to receive fasteners for attaching wallboard, siding, or the

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like, to the foam panel 62. In like fashion the plates 72, 74 have a similar function. This resolves a problem of prior art corner constructions that did not include a vertical plate member positioned near a corner, such as a corner 75. With the present invention, the positioning of a plate member, such as the plate member 72 or the plate member 74 at the corner 75 enhances the ability to construct and attach wallboard or the like to the corner of a foam form wall.

Figures 9-11 depict an alternative embodiment of the invention designed for use with a 135° corner section, such as the corner section 100 in Figure 10. The corner modular section 100 includes a corner bracket 102 again comprised of a horizontal assembly member 104 having at least one, and in the embodiment depicted two vertical slots 106 and 108, for receipt of the vertical plate members 110 and 112, respectively. The vertical plate members 110 and 112 are substantially identical to the vertical plate members 72, 74 affixed to a wing extension for the 90° corner construction. However, because the web or connecting portion 114 for the vertical plate members 110 and 112, as well as the connecting section 116 are flexible the vertical plate members 110 and 112 may be easily inserted and positioned in combination with the horizontal assembly member 102 to bridge the corner angle.

The horizontal assembly member 102 includes a foreshortened brace or extension 120 which generally bisects the angle defined by the wing extensions 104 and 107. The brace 120 extends only partially between the foam corner panels 100 and 101. Figure 11 is an isometric view of the obtuse angle corner construction of Figure 10 incorporating a corner bracket as depicted in Figure 9. It will also be observed that the modular corner form foam panels 100, 101 includes some straight side connectors or ties such as the connector 130 extending between the panels 100 and 101.

[33] While there has been set forth preferred embodiments of the invention, it is to be understood that the invention is limited only by the following claims and equivalents thereof.

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CLAIMS

What is Claimed is:

1. A corner bracket for combination with an insulating foam form for concrete and cement wall construction, said corner bracket comprising:

a first generally horizontal assembly member including a generally intermediate section having first and second wing extensions projecting laterally from each side of the intermediate section, said wing extensions forming an included angle;

said assembly member including a bracing element for maintaining the first and second wing extensions substantially at the included angle; and

at least one separate, generally vertical, plate member attached or attachable to at least one wing extension of the assembly member and extending substantially vertically with respect to the assembly member to comprise a reinforcing and attachment element upon at least partial encapsulation in a foam material.

- 2. The bracket of claim 1 wherein the assembly member comprises first and second wing extensions substantially at 90° to each other.
- 3. The bracket of claim 1 or 2 further including a vertical plate member attachable to each wing extension.
- 4. The bracket of claim 1 or 2 wherein the vertical plate member is slidably attached to the wing extension.
- 5. The bracket of claim 1 or 2 wherein the vertical plate member includes a detent and stop mechanism for retaining the vertical plate member attached to the wing extension.

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- 6. The bracket of claim 1 or 2 further including at least one generally horizontal bracket extension within the included angle defined by the first and second wing extensions.
- 7. The bracket of claim 1 or 2 further including at least one bracket extension within the included angle defined by the first and second wing extensions and generally bisecting the angle.
- 8. The bracket of claim 1 or 2 further including at least one bracket extension within the included angle defined by the first and second wing extensions and generally extending from an intersection of the first and second wing extensions and a distance sufficient to enable encapsulation of the wing extensions and a distal end of the bracket extension in separate foam panels.
 - 9. The bracket of claim 1 or 2 wherein the included angle is less than 90°.
 - 10. The bracket of claim 1 or 2 wherein the included angle is greater than 90°.
- 11. The bracket of claim 1 or 2 wherein the bracket is comprised of a molded plastic material.
- 12. The bracket of claim 1 or 2 in combination with at least one foam panel encapsulating at least in part the wing extensions and the vertical plate member.
- 13. The bracket of claim 1 comprising a horizontal assembly member with substantially mirror image first and second wing extensions connected together at a seam defining an apex of an included angle, each wing extension including a first plate member affixed to the first wing extension and a second plate member affixed to the second wing extension.

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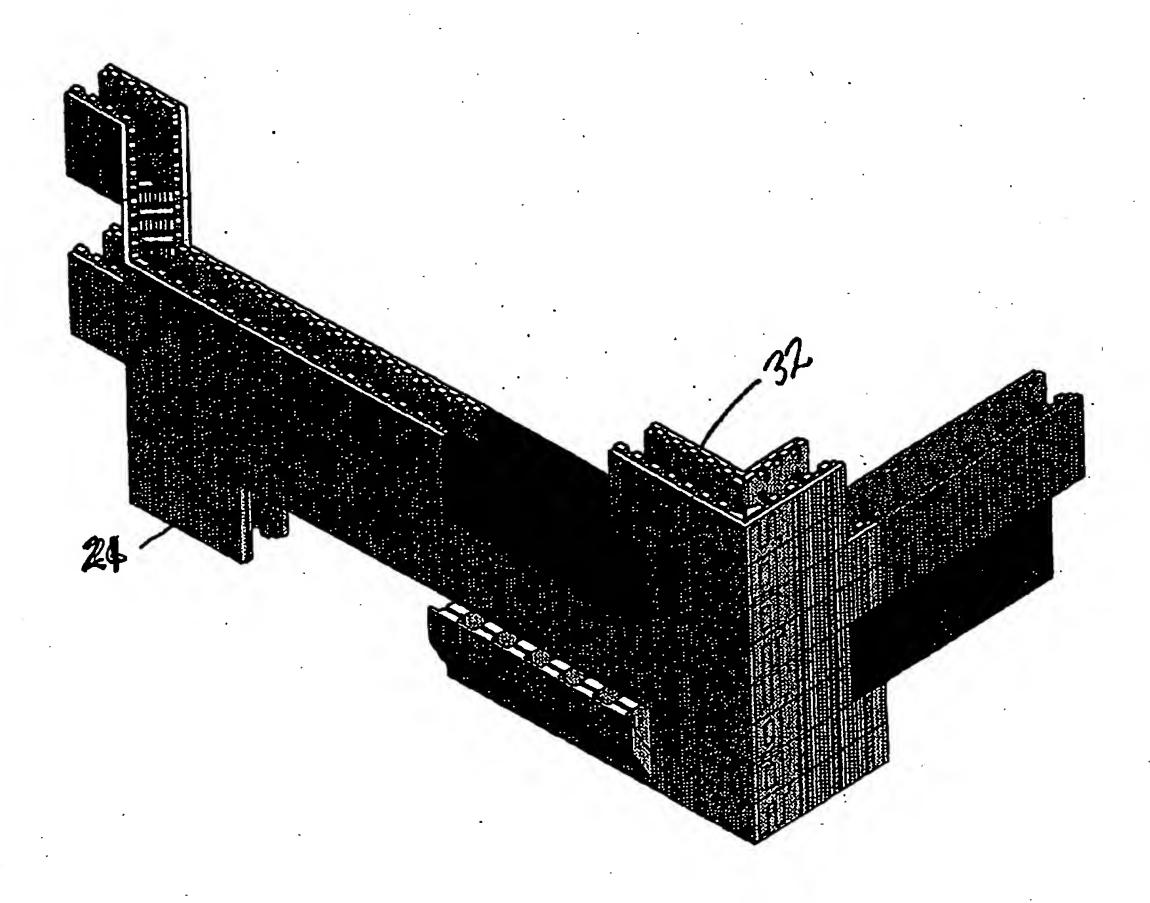
- 14. The bracket of claim 13 wherein the plate members are separate elements affixable to the said wing extensions.
 - 15. The bracket of claim 13 wherein the plate members are substantially of equal size.
- 16. The bracket of claim 13 wherein the plate members are substantially equally spaced from the seam.
- 17. The bracket of claim 13 further including a bracket element extending from the seam and generally bisecting the included angle between the first and second wing extensions.
- 18. The bracket of claim 13 wherein the first and second wing extensions define a substantially 90° included angle.
- 19. The bracket of claim 13 wherein at least one of the first and second wing extensions include a generally vertical track for cooperation with a plate member.
 - 20. The bracket of claim 13 wherein the included angle is less than about 90°.
- 21. The bracket of claim 13 including a bracket element extending from the seam for a distance capable of at least partial encapsulation in a first foam panel spaced from a second foam panel at least partially encapsulating at least one wing extension.
- 22. The bracket of claim 1 or 13 further including a first foam panel at least partially encapsulating at least one wing extension and said plate member.
- 23. The bracket of claim 1 or 13 further including a first foam panel at least partially encapsulating at least one wing extension and a said plate member and a second foam panel at least partially encapsulating the horizontal assembly member, said first and second foam panels being separated from each other to define at least part of a mold cavity.

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Connection Bracket for Modular, Corner Insulated Panel Concrete Wall Forms Inventors: Bradley J. Crosby et al.

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Sheet 1 of 7



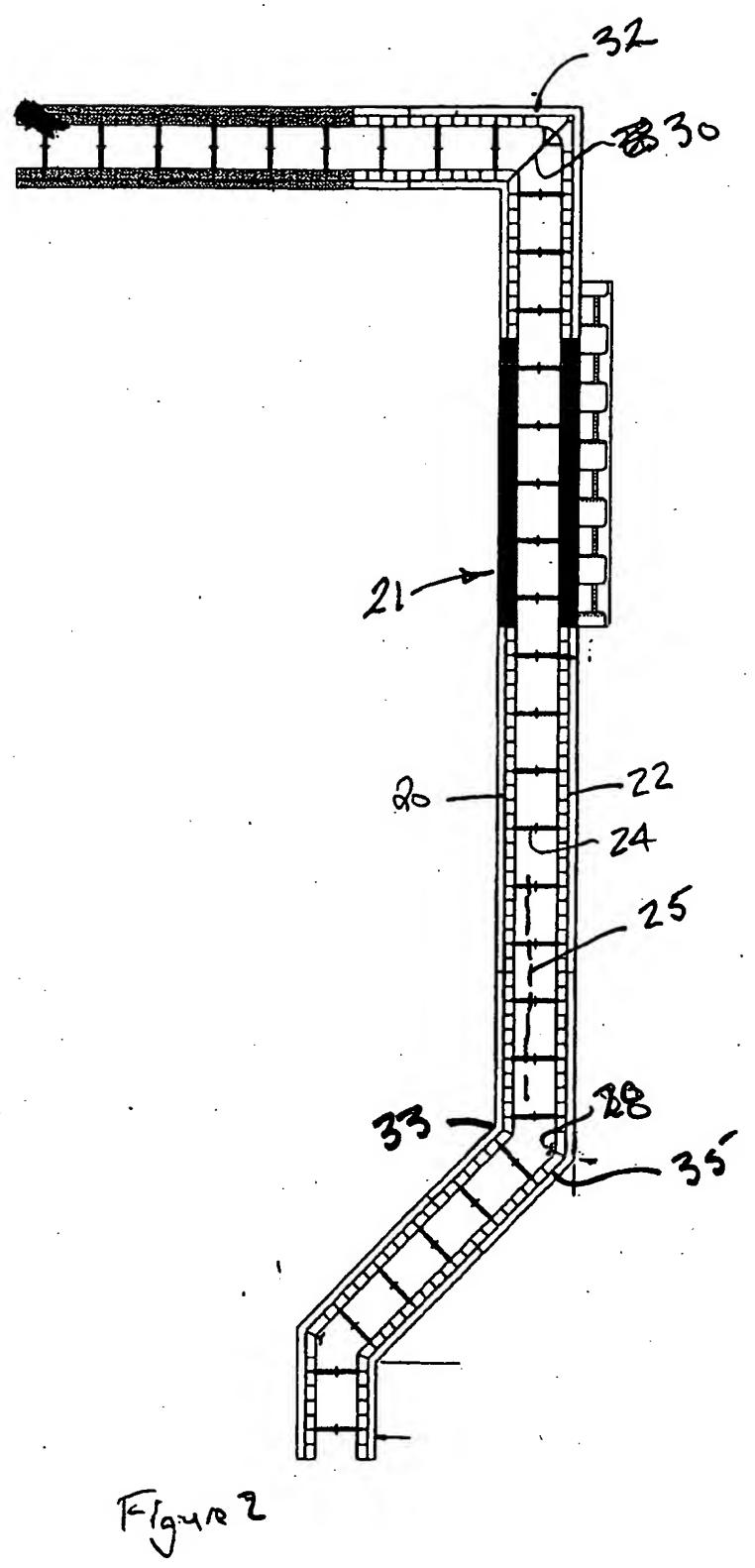
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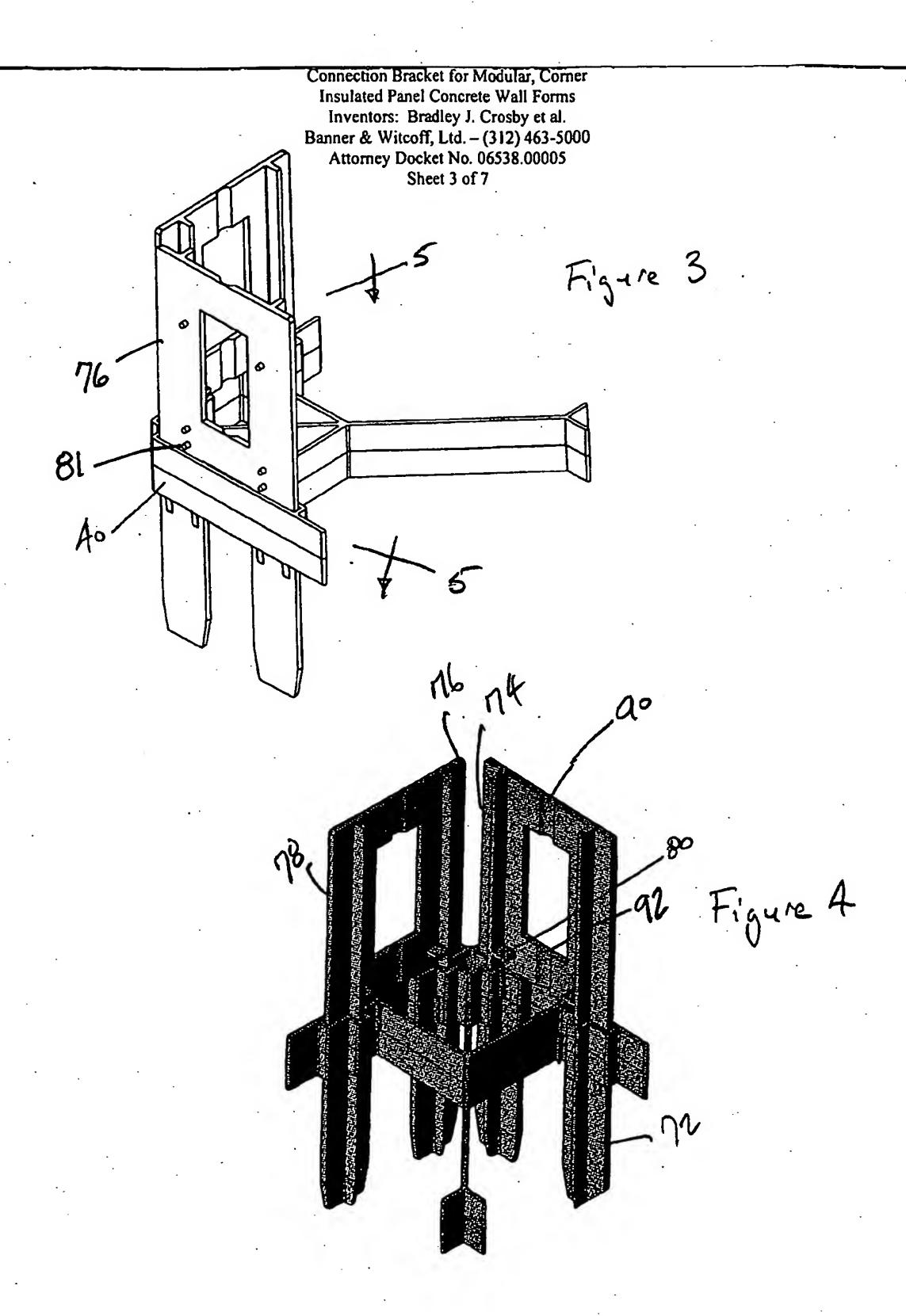
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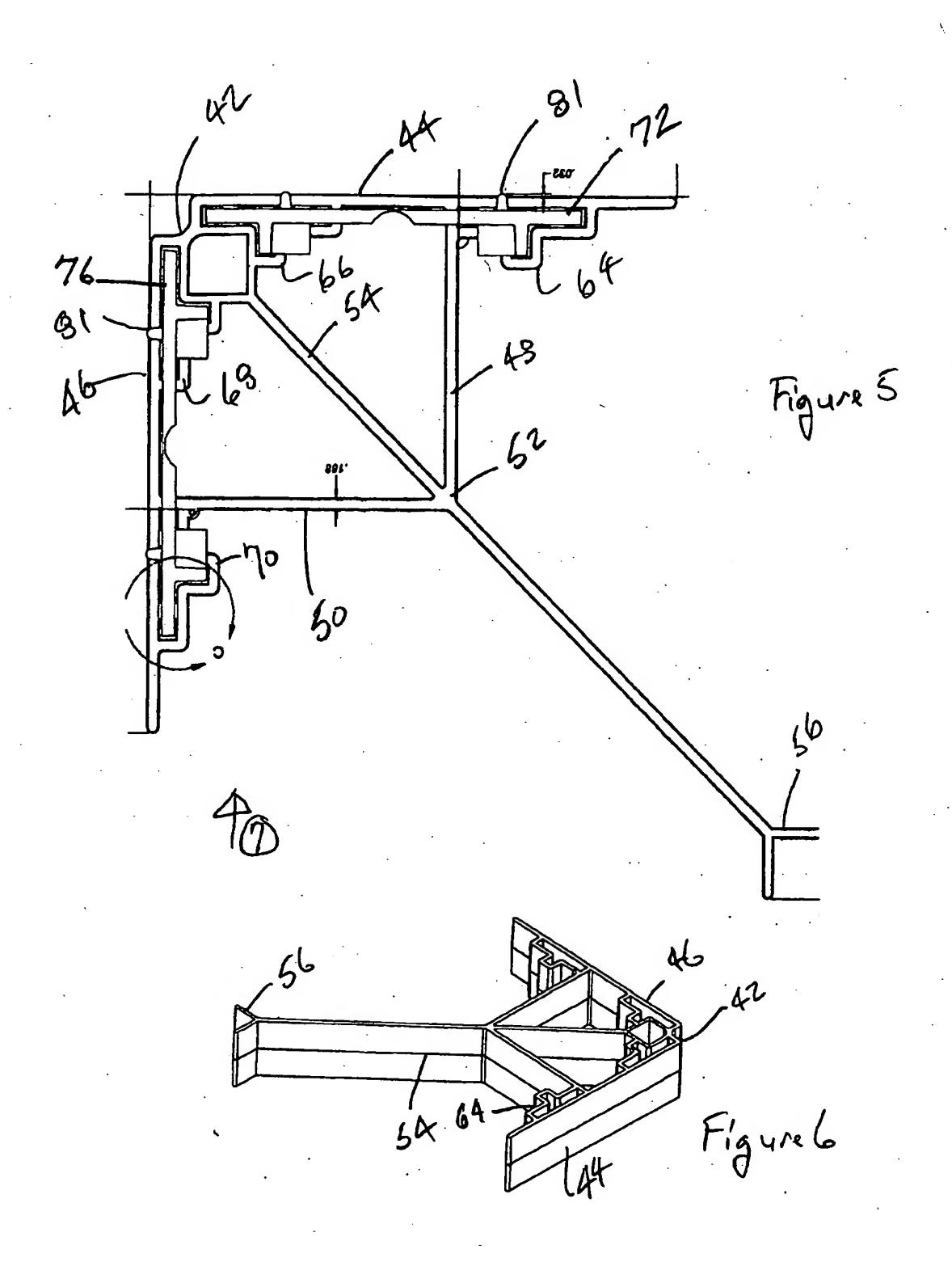
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Sheet 2 of 7





Connection Bracket for Modular, Corner Insulated Panel Concrete Wall Forms Inventors: Bradley J. Crosby et al. Banner & Witcoff, Ltd. – (312) 463-5000 Attorney Docket No. 06538.00005 Sheet 4 of 7

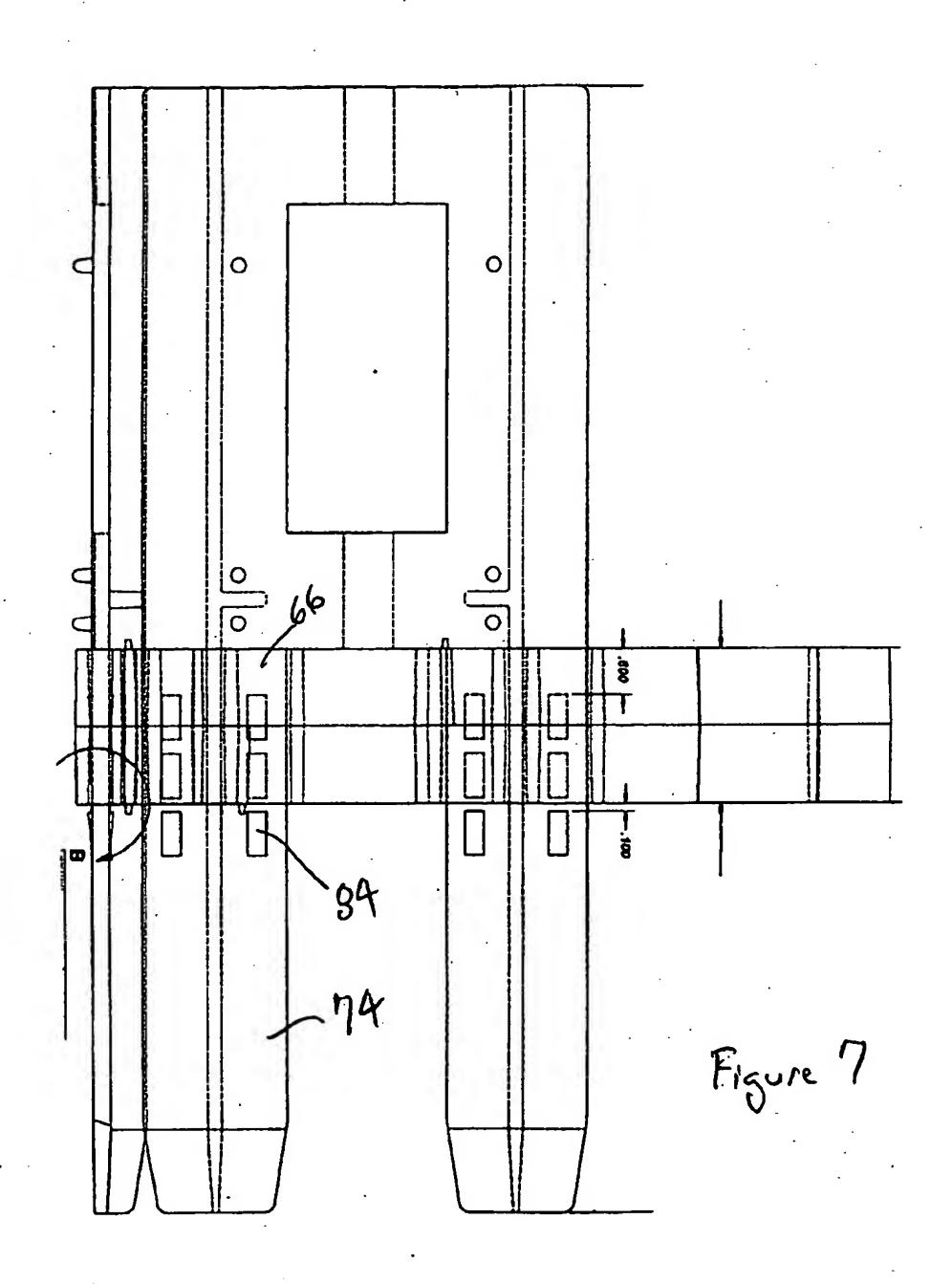


Connection Bracket for Modular, Corner Insulated Panel Concrete Wall Forms Inventors: Bradley J. Crosby et al.

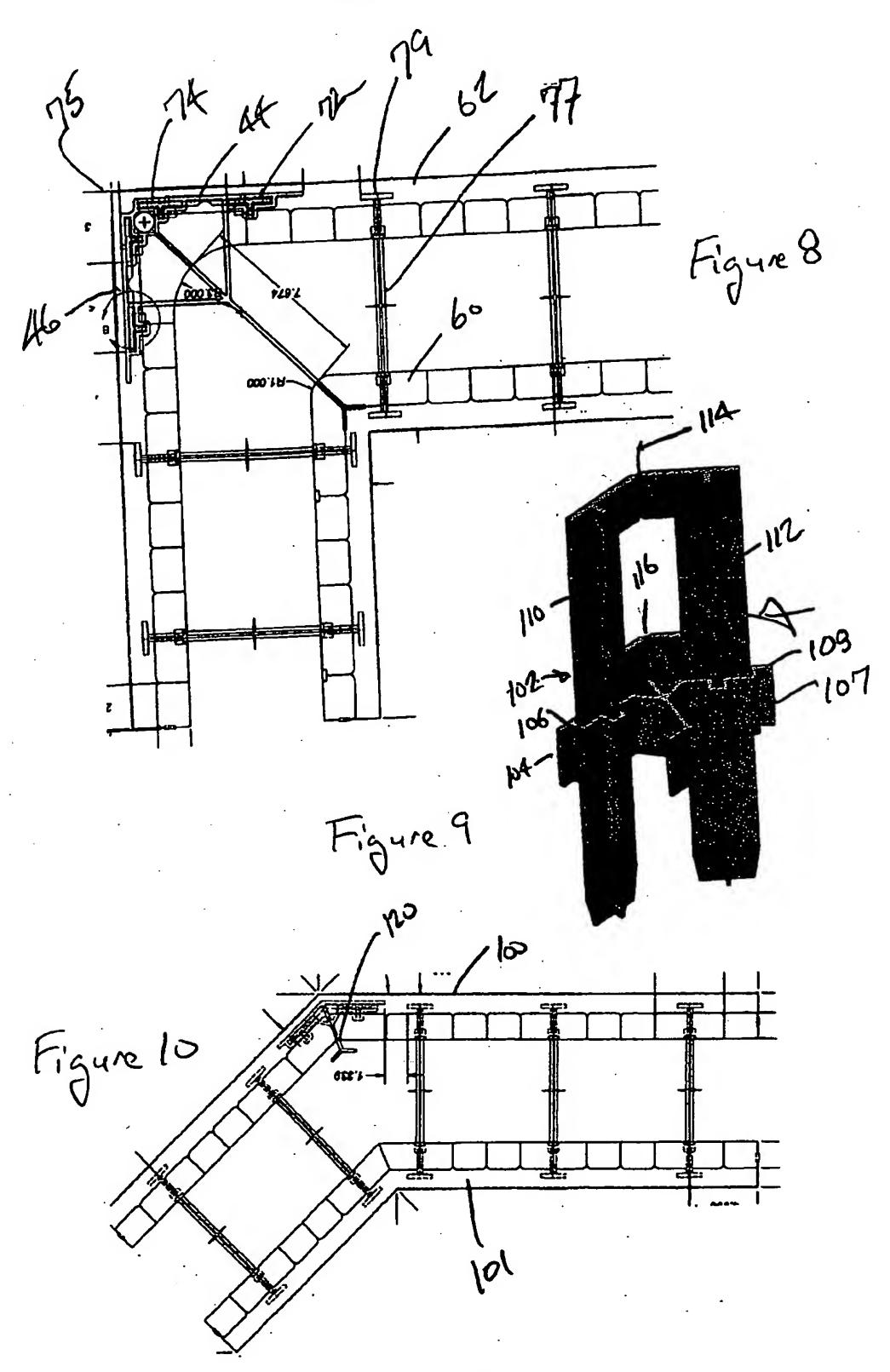
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Sheet 5 of 7



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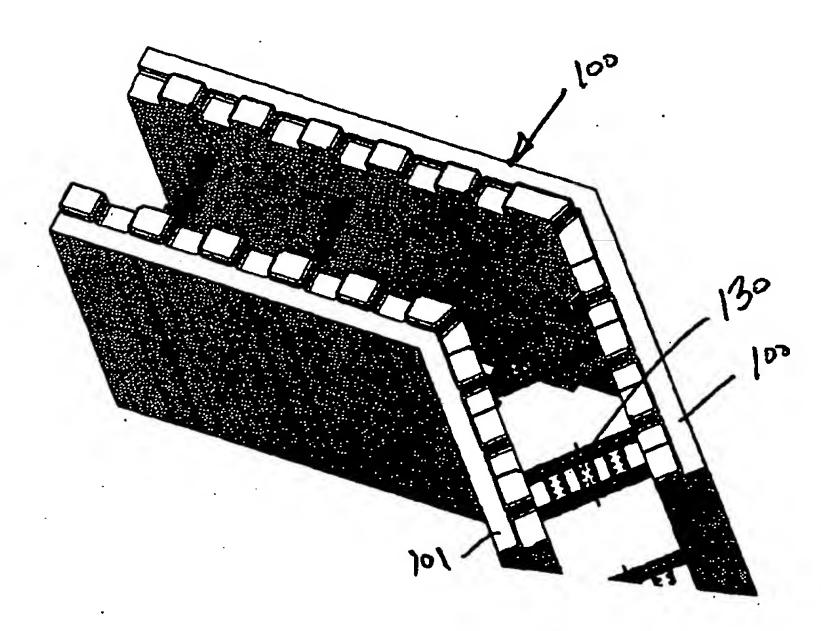


Figure 11

Application Data Sheet

Application Information

Contract or Grant Numbers:

| Application number:: | • |
|----------------------------------|----------------------------------|
| Filing Date:: | 01/14/05 |
| Application Type:: | Provisional |
| Subject Matter:: | Utility |
| Suggested classification:: | |
| Suggested Group Art Unit:: | |
| CD-ROM or CD-R?:: | None` . |
| Number of CD disks:: | |
| Number of copies of CDs:: | |
| Sequence submission?:: | |
| Computer Readable Form (CRF)?:: | |
| Number of copies of CRF:: | |
| Title:: | CONNECTION BRACKET FOR MODULAR, |
| | CORNER, INSULATED PANEL CONCRETE |
| | WALL FORMS |
| Attorney Docket Number:: | 06538.00005 |
| Request for Early Publication?:: | NO |
| Request for Non-Publication?:: | NO |
| Suggested Drawing Figure:: | |
| Total Drawing Sheets:: | 7 |
| Small Entity?:: | YES |
| Latin name:: | • |
| Variety denomination name:: | |
| Petition included?:: | NO |
| Petition Type:: | |
| Licensed US Govt. Agency:: | • |

Secrecy Order in Parent Appl.?:: NO

Applicant Information

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Primary Citizenship Country::

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Status::

Full Capacity

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Family Name::

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Country of Residence::

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USA Primary Citizenship Country::

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Patrick

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| | • | - | | |
|--|----------------------------------|----------------------------|-----------------------|----------------------|
| City of Residence: State or Province of Country of Resident Street of mailing as | of Residence:: | Omah NE USA 12612 | a Schroeder Circle | |
| Country of mailing | of mailing address:: | Omah NE USA 68137 | • | |
| Correspondence C | ce Information Customer Number:: | 22908 | | |
| Representative Representative Cu | stomer Number:: | 22908 | | |
| Domestic Prior | ity Information | | | |
| Application:: | Continuity Type | | Parent Application:: | Parent Filing Date:: |
| Foreign Priority | y Information | | <u></u> | |
| Country:: | Application num | ber:: | Filing Date:: | Priority Claimed:: |
| | | | | |
| | | | | |

Assignee Information

Assignee name:: Airlite Plastics Co.

Street of mailing address:: 6110 Abbott Drive

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